NASA

Defense support payload aboard space shuttle.

DOD

Space and Joint Space Doctrine

By HOWELL M. ESTES III

EDITOR'S *Note*

Recent experiences during Just Cause and Desert Shield/Desert Storm have demonstrated the need for joint space doctrine. When thoroughly integrated into joint operations, space assets will prove to be a significant force multiplier and also possess the potential for independent space application. This capability largely depends on understanding the uses of our space forces. Doctrine can provide both principles and a framework for comprehending and integrating space capabilities. This doctrine will be even more important in the future, as potential enemies notice our increasing reliance on space. Joint doctrine must address our use of space while denying it to an enemy.

General Howell M. Estes III, USAF, is commander in chief, U.S. Space Command.

When Americans think of space, they most likely envision the manned space program and the National Aeronautics and Space Administration (NASA). Some might imagine the commercial advantages of space, and a few might identify its military use. In fact, space is all of these things, but according to national space policy there are three distinct functions involved: civil, commercial, and military. NASA is responsible for civil functions (such as the shuttle and scientific projects), corporations seek

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commercial applications (such as communications for cable and direct broadcast television), and U.S. Space Command (SPACECOM) is entrusted with most military applications.

Need for Doctrine

The use of space for national security purposes has come a long way since the first military satellites went into orbit. Such assets can no longer be viewed as extensions of terrestrial systems. Space is the fourth operating medium—a region where unique capabilities offer a tremendous force multiplier and potential for independent force applications. Joint forces must understand the many uses of space, have free access to it, make use of the full potential of space forces, and be capable of denying an enemy the warfighting advantages available through access to and use of it.

Recent conflicts have demonstrated the need for joint space doctrine. Experience gained in Just Cause and Desert Shield/Desert Storm as well as lesser contingencies such as Joint Endeavor influences joint doctrine development in this area. In these operations, space forces contributed to everything from mission planning to execution. Given emerging technologies, the impact of space forces will increase and become a major force multiplier when fully integrated into joint operations.

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That integration requires a broader understanding of how space forces contribute to joint warfighting and the ways in which military space operations should be used. Doctrine is based on an analysis of the current mission, its history, the threat, the evolving state of technology, and the underlying military concepts of operations. Joint space doctrine will offer a common framework and basic principles from which to plan and operate and will fundamentally shape the way in which we regard and train for joint space operations. More importantly, it will allow joint commanders and their planners to understand space as an aggregate of capabilities rather than a single asset.

The United States has not confronted an enemy who can rival our space capabilities or deny us the ability to exploit them. However, we are experiencing a global proliferation and increasing sophistication of such capabilities. As we evaluate the contributions of space and incorporate their lessons into doctrine, potential enemies will take note of our increased reliance on space and realize the value of utilizing it themselves, but more importantly, will attempt to disrupt our use of it. Joint doctrine must consider protecting our capabilities in this medium and denying them to an enemy. We call this space control, akin to sea control and control of the air.

Command Responsibilities

With recognition of the growing military importance of space in the late 1970s, the need for a joint space force commander became apparent. SPACECOM was activated in September 1985, creating a single operational military organization to oversee and manage most DOD space forces. The missions of SPACECOM under the unified command plan fall into four areas. First, it supports the North American Aerospace Defense Command (NORAD) with missile warning and space surveillance data. Second, it advocates space requirements for CINCs. Third, it conducts planning for strategic ballistic missile defense (BMD) and, once a decision on deploying a national missile defense system is made, SPACECOM will operate assigned BMD forces. And fourth, the heart of what it does day to day is space operations.

The space operations mission has four parts: space control, space force application, space forces support, and space force enhancement. As mentioned, control enforces space superiority by ensuring our free access to space while denying it to an enemy. This is done through surveillance, protection, prevention, and negation. Force application applies force from or through space into the terrestrial media—land, sea, and air. Forces support launches military satellites into orbit and operates them, which is the enabling mission to other space missions. Finally, force enhancement provides space support to regional warfighters.

SPACECOM strives to provide assured support to the National Command Authorities, Chairman, combatant commands, and other agencies throughout the range of military operations. Normally, the commander in chief, U.S. Space Command (CINCSPACE), functions in a supporting role to terrestrial CINCs or joint force commanders (JFCs). However, in accordance with Joint Pub 0-2, *Unified Action Armed Forces*, he can be a supported or supporting CINC, depending on the nature of the mission. SPACECOM operates its forces through service components, with CINCSPACE retaining command of space forces which ensures the most effective use of global space assets.

Military Operations

SPACECOM forces function in a distinct area of operations to support military operations in theater. The role of military space operations can be understood by examining five points on the nature of modern warfare contained in Joint Pub 1 from a space perspective.

First, the environment that space forces face in support of U.S. national interests is more than global. It includes the "area" of space. The ability to project and sustain our military power worldwide is a basic requirement of the Armed Forces. The rapid access, presence, and capabilities space forces provide enhance our ability to do that effectively and efficiently.

Second, these capabilities result from technological advances. Space forces especially use new technologies to improve global command and control, navigation, environmental monitoring, surveillance and reconnaissance, and mapping, charting, and geodesy.

Third, the speed of communications and tempo of events, as well as the need to conduct operations inside an enemy decision cycle, require the

capability to rapidly monitor and respond to events worldwide. Space forces provide a continuous global presence to observe and quickly react on all levels of military operations.

Fourth, the contribution of space forces to joint operations depends on people—space and terrestrial warfighters. Supported commanders and their staffs must appreciate the capabilities and use of space force personnel who, in turn, must understand the needs of those whom they support. Lastly, commanders of space forces must make space accessible, understandable, and usable.

Fifth, space forces can decrease the fog of war to provide the warfighter a clearer picture of the battlespace—reducing uncertainty and friction. The goal of information superiority contained in *Joint Vision 2010* is just that. With space forces, we can rapidly observe, hear, understand, and exploit a battlespace environment anywhere in the world, even in remote locations, with little or no local support infrastructure. Such a flow of information from and through space has been crucial to modern warfare. It has allowed JFCs to gather ever more information and it is going to get even better. When this intelligence is coupled with ongoing advances in processing, commanders will operate with relative certainty, at increasing operational tempos, and at levels of effectiveness never before possible.

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Unlike most military operations, space operations are continuous. Once our systems are in place they provide global support 24 hours a day. SPACECOM components function across the full spectrum of conflict—from peace to war. In crisis or conflict these systems, already fully operational, can quickly be retasked to specific joint operations. In other words, commanders can select those capabilities that best support their missions. This process is dynamic and varies with each situation. Moreover, it is tailored by warfighters for warfighters.

The supported terrestrial commanders must integrate space into joint operation or campaign plans by blending space support into offensive and defensive operations and planning for changing situations. In particular, they must employ ground-based equipment required to receive, process, and disseminate products from space forces and train personnel on these systems. For instance, space forces may furnish missile warning information from space-based surveillance systems, but supported commanders must receive it, integrate it with data from other warning and surveillance assets, and use it in theater missile defense operations.

Space forces serve numerous customers and not all are military—in fact, civil and commercial users are rapidly expanding. This could have a growing impact on military users of space systems and must be considered in planning joint operations. For example, the global positioning system (GPS) also supports both civil and commercial users, thereby restricting military capabilities. In the future, the United States plans to make an unaltered signal available to all users. This points out the importance of the military pursuit of navigation warfare to ensure use of the signal by the Armed Forces in a contingency while regionally denying its use to an enemy.

Space Support

Warning of ballistic missile attack has been a bedrock space mission since the early 1970s and has been achieved through defense support program (DSP) satellites. This program was built to warn of a strategic missile attack upon North America but now includes theater ballistic missile strikes. Scud attack warnings in Desert Storm were the first combat use of this expanded capability. Since then SPACECOM has improved the fidelity of DSP information. Today we have pretty much maximized this capability and are planning a successor, a space-based infrared system.

Satellite communications are almost transparent but essential to terrestrial forces. There are many areas of the world, especially oceans and remote locations, where such communications are the lifeline of military operations. They are critical where there is inadequate infrastructure. There are several military communication satellite systems, including the defense satellite communications system (DSCS) which provides a high volume global capability. We are modifying the remaining DSCS spacecraft and employment doctrine to provide more information to lower command levels. Because of expanding demands for support, we expect a blend of military, civil, commercial, and international systems to meet our future satellite communications needs. With such a fusion, our forces will need a focal point to ensure the availability of satellite communications. SPACECOM is working with the Joint Staff and others to achieve this goal.

Weather forecasting is another contribution. Data from satellites assist resource protection, operational timing, flight planning, ship routing, munitions selection, chemical attack dispersion predictions, radar and communication anomaly resolution, and targeting. To offer better weather support of our forces at lower costs, defense meteorological satellite program (DMSP) satellites are converging with National Oceanographic and Atmospheric Administration weather satellites.

Nontraditional uses of our forces are expanding worldwide even as overall military forces are drawn down and our permanent overseas presence is reduced. The role of space in helping to get the most out of our forces in these operations is growing. The most familiar example is GPS satellites providing worldwide precision navigation and geopositioning. The first major use of that system took place in Desert Storm when it proved to be a resounding success.

A final example of space support is intelligence from space-based systems. Whereas SPACECOM owns and operates GPS for navigation, DSP satellites for missile warning, DSCS military communications satellites, and DMSP satellites for weather, we do not own or

Northrop Grumman

Lockheed

Pathfinder launch vehicle, Vandenberg AFB.

operate any intelligence satellites. They belong to the National Reconnaissance Office (NRO) and serve varied uses—not just military. Intelligence satellites were originally focused far more on strategic needs. Recently, however, there has been a growing emphasis on support to military operations by these systems. Tactical exploitation of national capabilities organizations by the services has been vital to forging closer ties between NRO and military operations. SPACECOM and its component space support teams are engaged in helping warfighters to better understand and utilize NRO intelligence satellites as well as fielded SPACECOM capabilities. Members of the NRO operational support office are part of these space support teams at both joint and component levels. The NRO and SPACECOM are working to provide a single operational focus for all satellites that support military operations.

The Future

The medium of space will become even more important as new initiatives and technologies come to the fore. Control of it is becoming integral to battlespace dominance. The integration of space forces into theater and global warfighting must continue. Many traditional land, sea, and air missions will increasingly migrate to space. U.S. information dominance cannot be assumed in the future as potential enemies gain access to similar information and assets. Global partnerships among members of the civil, commercial, and military sectors will increase as all parties attempt to streamline infrastructure and cut costs. The task will be preserving core military space capabilities as we expand our ties to civil, commercial, and international systems.

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A review of programmed and potential initiatives illustrates the increasing impact of space. In the decades ahead, SPACECOM will not only "support from space" but will "operate from space." The space and missile tracking system will provide ballistic missile warning with improved launch location determination and the possibility of boost phase intercept. Space-based radars, lasers, and possibly weapons will further enhance SPACECOM effectiveness. The global broadcast service will give warfighters the right data in the right place at the right time while advances in processing capabilities will help to create dominant battlespace awareness in future conflicts. Ballistic missile defense—theater or national—will be a huge space-intensive endeavor. In addition, the military space plane will, among other things, greatly reduce the time and cost of putting satellites in orbit, opening new opportunities for less expensive systems. These and other initiatives will offer robust capabilities to ensure that our national interests are protected.

Space forces have evolved dramatically in the relatively short time since the first satellites went into orbit. The number of nations and commercial firms which have or are developing space capabilities is growing. This makes access to information and application—much of which has military utility—commonplace. JFCs have come to rely on space assets not as a remote activity of specialists or the strategic community but as vital partners in conducting military operations.

The United States has enjoyed relative freedom in space and has not yet engaged an enemy that can duplicate or deny our space capabilities. We must ensure that this situation does not change in the future. Space is the fourth medium. Joint doctrine must bring the military facets of space into focus to maximize the potential of the Armed Forces. **JFQ**